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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/701,128	11/03/2003	William Mark Hiatt	108298657US1	4852
25096	7590	01/11/2005	EXAMINER	
PERKINS COIE LLP			SCHILLINGER, LAURA M	
PATENT-SEA			ART UNIT	
P.O. BOX 1247			PAPER NUMBER	
SEATTLE, WA 98111-1247			2813	

DATE MAILED: 01/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/701,128

Applicant(s)

HIATT ET AL.

Examiner

Laura M. Schillinger

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 December 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 10-37 is/are pending in the application.
- 4a) Of the above claim(s) 18-37 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 10-15 and 17 is/are rejected.
- 7) ☒ Claim(s) 16 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- 1) ☐ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 11/03/03.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

Claim 16 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 10-15, 17 are rejected under 35 U.S.C. 102(b) as being anticipated by Yamada et al ('178).

Yamada teaches the following claimed limitations as cited below:

10. A method for packaging a microelectronic substrate, comprising:
providing a microelectronic substrate (71) having a first surface, a second surface from the first surface, and a plurality of first connection facing opposite sites (74) at least proximate to the first surface (Fig. 1);
disposing flowable, electrically conductive couplers at the first connection sites (APA-Fig.1 (73));

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disposing a generally non-conductive material between the conductive couplers (Fig.2 (78));

select a gap dimension based on a target underfill material flow rate (Col.34, lines: 35-55), the gap having the selected gap dimension in a direction generally normal to the first surface of the microelectronic substrate (Fig.1 (gap));

removing at least a portion of the generally non-conductive material to form a gap between neighboring conductive couplers (Col.16, lines: 40-52);

connecting the microelectronic substrate to a support member by attaching the conductive couplers to second bond sites of the support member ((Fig.1 (75)) and

flowing an underfill material into the gap at least approximately the target underfill material flow rate (Fig.1 (78)).

11 . The method of claim 10 wherein selecting the gap dimension includes selecting the gap dimension to be at least 25 microns (Col.5, lines: 55-10).

12. The method of claim 10 wherein the underfill material includes a plurality of particles having a mean diameter, and wherein selecting the gap dimension includes selecting the gap dimension to be at least three times the mean diameter of the particles (Col.25-26, lines: 45-5).

13. The method of claim 10 wherein the microelectronic substrate has a plurality of edges, and wherein the method further comprises disposing the underfill material along at

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least one of the edges, further wherein flowing an underfill material into the gap at least approximately the target underfill material flow rate includes filling the gap before the underfill material wicks completely around the edges of the microelectronic substrate (Col.15-16, lines: 60-10).

14. The method of claim 10, further comprising selecting the conductive couplers to include solder balls (Fig.1 (73)).

15. The method of claim 10, further comprising selecting the conductive couplers to include a flux material and a plurality of solder particles disposed in the flux material (Col.25, lines: 45-55).

17. The method of claim 10 wherein removing at least a portion of the generally non-conductive material includes etching at least some of the generally non-conductive material (Col.37, lines: 55-65).

Allowable Subject Matter

The following is a statement of reasons for the indication of allowable subject matter: In reference to claim 16, prior art fails to teach nor suggest further comprising removing material from the second surface of the microelectronic substrate to thin the microelectronic substrate before removing at least a portion of the generally non-conductive material in combination with the elements recited in claim 10. Consequently, claim 16 contains allowable subject matter.

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Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Laura M. Schillinger whose telephone number is (571) 272-1697. The examiner can normally be reached on M-T, R-F 7:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl W. Whitehead, Jr. can be reached on (571) 272-1702. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


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